

8. On the Ophidian Genus *Grayia*.

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(Text-figures 295-299.)

The progress in our knowledge of African Snakes due to increased material has shown the genus *Grayia*, established by Dr. Günther in 1858 †, to be much in want of revision. The discovery of *Grayia tholloni* has so completely bridged over the gap separating this genus from *Xenurophis* Günther, that I no longer think the latter can be maintained. The two species *Grayia smithii* Leach, and *Grayia furcata* Mocq., which I retained as distinct in the Catalogue of Snakes (vol. ii., 1894) were erroneously characterized, and the name of the latter has to be altered to that of *ornata* proposed at an earlier date by Barboza du Bocage. Thanks to the courtesy of my friend and colleague Prof. Dollo, C.M.Z.S., I have received the loan of the type specimen of his *Grayia giardi*, the true affinities of which I had overlooked, and which I am now convinced should be referred to the synonymy of *Tropidonotus olivaceus* Peters. Another species more recently described as *Grayia lubrica* W. Slater, Ann. S. Afr. Mus. i. 1898, p. 109, must also be withdrawn as synonymous with *Tropidonotus laevis* Günther, the habitat of which long remained unknown, but of which I have recently received a specimen from Natal through Dr. E. Warren.

The genus *Grayia*, after these eliminations, embraces four species—*G. ornata*, *G. smithii*, *G. tholloni*, of which revised descriptions are here given, and *G. caesar*.

GRAYIA ORNATA.

Macrophis ornatus Bocage, Journ. Sc. Lisb. i. 1866, p. 67.

Glaniolestes ornatus Peters, Mon. Berl. Ac. 1877, p. 614.

Grayia furcata Mocquard, Bull. Soc. Philom. (7) xi. 1887, p. 71; Bouleng. Cat. Sn. ii. p. 287 (1894).

Grayia triangularis (non Hallow.), Günth. Ann. & Mag. N. H. (6) i. 1888, p. 325.

Grayia smithii, part., Bouleng. Cat. Sn. ii. p. 286; Werner, Verh. zool.-bot. Ges. Wien, xlix. 1899, p. 138; Bouleng. Proc. Zool. Soc. 1900, p. 453; Sternfeld, Mitth. Zool. Mus. Berl. iv. 1908, p. 231.

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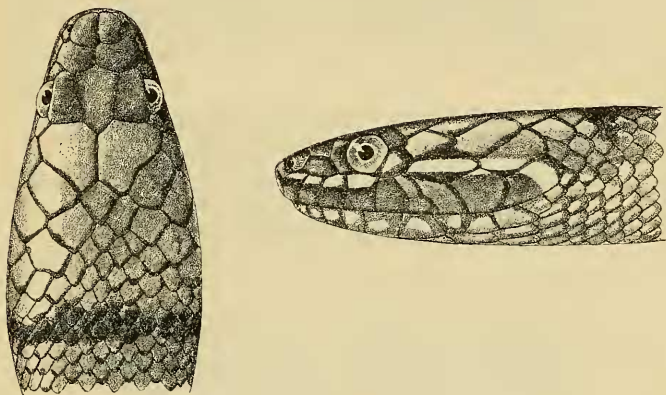
† The name *Grayia* might be objected to as preoccupied in Zoology; it had long ago been changed by Cope (*Glaniolestes*) on the ground of its preoccupation in Botany. However, on referring to the zoological paper in which the prior use of the name occurs (C. R. Ac. Sci. xliii. 1856, p. 841), I find that *Grayia*, Bonaparte, is merely a *nomen nudum* for a subgenus of *Palapteryx*, Owen.

Grayia ornata Bocage, Herp. Angola, p. 104 (1895); Mocquard, Bull. Soc. Philom. (8) ix. 1897, p. 8.

Grayia smythii (non Leach) Sternfeld, Mitth. Zool. Mus. Berl. iv. 1908, p. 409.

Eye moderate in the adult, shorter than its distance from the nostril, as long as its distance from the oral border, larger in the young. 22 to 27 maxillary teeth on each side. Rostral once and a half to once and two-thirds as broad as deep, just visible from above; nasal divided or semidivided; internasals as long as broad or a little longer, as long as or a little shorter than the præfrontals; frontal once and a half to twice as long as broad, as long as or a little longer than its distance from the end of the snout, as long as or slightly shorter than the parietals; loreal once and

Text-fig. 295.



Head of *Grayia ornata*.

one-third to twice as long as deep*; one præ- and two post-oculars; temporals 2+3, lower anterior not longer than its distance from the loreal; eight upper labials, fourth entering the eye (rarely nine, third and fourth entering the eye†), the last about as long as the two preceding combined; one or several of the labials behind the eye usually divided into two, a small triangular shield being often intercalated between the fifth and sixth labials‡; four or five lower labials in contact with the anterior chin-shields, which are not or but slightly shorter than the posterior. Scales in 17 to 20 rows on the body, usually 19, in 6 rows on the greater

* Absent on the right side in spec. 13 (Kasayo, Congo).

† In one specimen, No. 5 (Assobam, Cameroon); the type of *G. triangularis* is also described as having nine upper labials.

‡ No division of the upper labials in a specimen from Bitye (No. 3).

part of the tail. Ventrals 143-157; anal divided; subcaudals 71-84.

As regards the coloration, this species appears to fall into two principal forms—the typical, originally described from Duque de Bragança, Angola, and Mocquard's *G. furcata*, from Brazzaville, Congo, which Bocage also records from Duque de Bragança, and which seems to be the common form in Cameroon and the Gaboon.

G. ornata is thus described by Bocage from a specimen 1640 millim. in length:—Olive above, with numerous irregular deep black spots, confluent on the tail and the posterior third of the body, much better separated on the middle third, and again confluent on the anterior third, where they form a broad longitudinal band from the occiput to a distance of about 150 millim.; two parallel black bands along the side of the anterior third of the body, the upper the broader, extending from the first upper labial, the lower extending from the third ventral shield; head olive above, irregularly spotted with black, the lateral shields edged with black; two black streaks on the temporal region; greenish yellow beneath, the shields spotted and edged with black.

A specimen from the Gaboon in the British Museum (no. 12) appears to represent the young of the typical *G. ornata*. It is dark brown above, with black spots having a tendency to form longitudinal lines; the sides of the head and of the body, and the lower parts are black; two broken-up white lines along the sides, the upper the better developed and extending over the temple to the eye; some white spots on the labial shields and under the head; tail and posterior part of body uniform black.

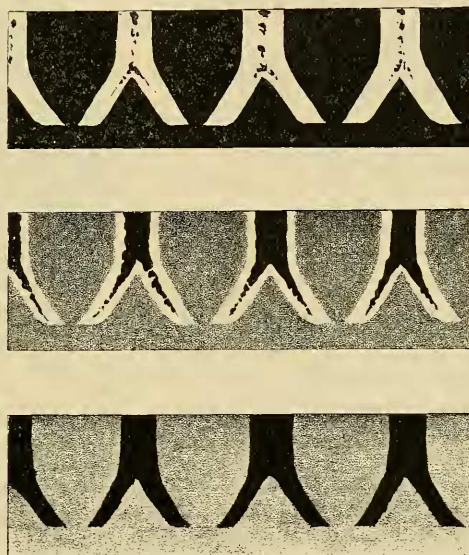
Mocquard's *G. furcata* is based on a specimen a little over a metre in length, greyish brown above, with 25 black cross-bars, not half as broad as the spaces between them, these bands bifurcating towards the ventrals, the sides showing very regular A-shaped black figures; the body turns to a uniform blackish brown towards the tail; ventral region dirty white in front, blackish brown towards the tail, which is black above and blackish brown beneath; the upper head-shields are blackish brown, except the parietals, which are fulvous edged with black; sides and lower surface of head grey, the shields edged with black.

This description applies tolerably well to specimens from South Cameroon, the Gaboon, and Central Africa, in the British Museum. The back bars number 21 to 25, exclusive of such as may be present on the tail, which is not always black; the parietals are more or less distinctly lighter in colour than the other head-shields, the sides of the head are brown or blackish with white spots on the labials and temporals, those behind the eye corresponding to the white line shown by the young specimen of the typical form mentioned above; the belly is yellowish or greyish white, at least the posterior ventral shields spotted, freckled, or edged with black. A specimen from the Gaboon

(no. 11) is almost uniform brown above, the darker cross-bars being very indistinct and not forked on the sides.

Young specimens are very remarkable in showing an inversion of the markings of *G. furcata*, or rather, as pointed out by Dr. Mocquard, being the negative of what is considered the positive in the adult. The snake may be described as black with light, whitish, or greyish cross-bands (15 to 32 in number), bifurcating on the side. I have long been at a loss to explain how the change takes place, but I have now succeeded in bringing

Text-fig. 296.



Side view of body of *Grayia ornata*.

Diagrams showing changes in markings with age.

together enough material of different ages to throw satisfactory light on this point. The black ground-colour gradually passes to grey or brown, whilst a black bar develops and enlarges within the light bars of the young, which later become reduced to a narrow white margin to the former and finally disappear. The three diagrams (text-fig. 296) will explain the change better than a lengthy description.

The largest specimen examined by me measures 1030 millim. ; tail 260.

This species is known from Cameroon, the Gaboon, the Congo, and Angola.

List of the specimens in the British Museum.

1. Hgr. ♀.	Sc. 20; V. 154; C. ?	Efulen, S. Cameroon.	G. L. Bates, Esq. (C.).
2. ♂.	Sc. 19; V. 151; C. ?	Bitye, "	"
3. Hgr. ♂.	Sc. 17; V. 145; C. 83.	" "	"
4. ♀.	Sc. 19; V. 157; C. 71.	" "	"
5. Yg.	Sc. 17; V. 152; C. 79.	Assobam, "	"
6. Yg.	Sc. 20; V. 147; C. 84.	Benito R., Spanish Guinea.	"
7. ♂.	Sc. 19; V. 145; C. 79.	Ogowe, Gaboon.	Dr. W. J. Ansorge (C.).
8. Yg.	Sc. 19; V. 143; C. ?	Nehali, nr. Fernan Vaz.	"
9. Yg.	Sc. 19; V. 153; C. 80.	Lambarene, Ogowe.	Miss Kingsley (C.).
10. Yg.	Sc. 19; V. 145; C. ?	Sette Cama, Gaboon.	"
11. ♂.	Sc. 19; V. 147; C. ?	Gaboon.	"
12. Yg.	Sc. 17; V. 147; C. 82.	"	"
13. Hgr. ♀.	Sc. 17; V. 143; C. 71.	Kasayo, Congo.	Dr. J. L. Todd (P.).
14. Yg.	Sc. 17; V. 148; C. 74.	Congo.	"
15. ♂.	Sc. 19; V. 150; C. 83.	C. Africa.	Warrington Museum (E.).

GRAYIA SMYTHII.

Coluber smythii Leach, in Tuckey's Explor. R. Zaire, App. p. 409 (1818).

Coluber levis (non Lacep.), Hallow. Proc. Ac. Philad. 1844, p. 118.

Coronella triangularis Hallow. Proc. Ac. Philad. 1854, p. 100.

Heteronotus triangularis Hallow. Proc. Ac. Philad. 1857, p. 68.

Grayia silurophaga Günth. Cat. Col. Sn. p. 51 (1858); F. Müll. Verh. Nat. Ges. Basel, vii. 1885, p. 683.

Leionotus schlegeli Jan, Elenco Ofid. p. 68 (1863), and Arch. Zool. Anat. Phys. iii. 1865, p. 241.

Grayia triangularis Bocage, Journ. Sc. Lisb. i. 1866, p. 47; Boettg. Ber. Senck. Ges. 1887-88, p. 51; Bocage, Herp. Angola, p. 102 (1895).

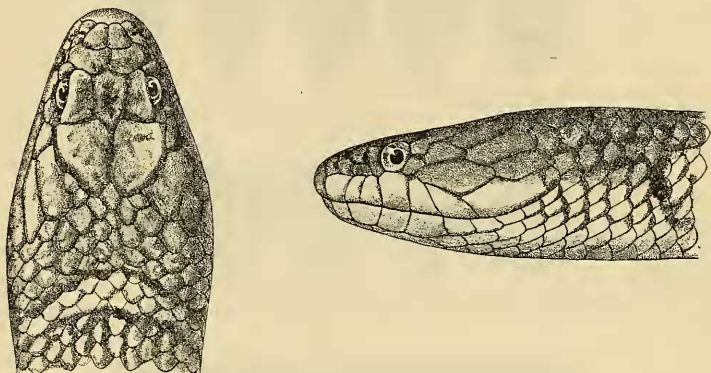
Grayia smythii, part., Bouleng. Cat. Sn. ii. p. 286 (1894); Werner, Verh. zool.-bot. Ges. Wien, xlix. 1899, p. 138; Bouleng. Proc. Zool. Soc. 1900, p. 453; Sternfeld, Mitth. Mus. Berl. iv. 1908, p. 231.

Grayia smythii Günth. Ann. & Mag. N. H. (6) xv. 1895, p. 525.

Eye rather small in the adult, shorter than its distance from the nostril, as long as its distance from the oral border, larger in the young. 22 to 25 maxillary teeth on each side. Rostral once and one third to once and a half as broad as deep, just visible from above; nasal divided or semidivided; internasals as long as broad or a little longer than broad, as long as or longer than the præfrontals; frontal once and two thirds to twice as long as broad, longer than its distance from the end of the snout, as long as or a little shorter than the parietals; loreal as long as deep or a little longer; one præ- and two postoculars; temporals 2+3, lower anterior longer than its distance from the loreal, sometimes as long as its distance from the rostral; seven upper labials

(rarely eight through division of the last *), seventh (if undivided) as long as the three preceding combined, fourth entering the eye; four or five lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 17 rows on the body, in 6 or 4 rows on the greater part of the tail. Ventrals 145-168; anal divided; subcaudals 89-102.

Text-fig. 297.



Head of *Grayia smythii*.

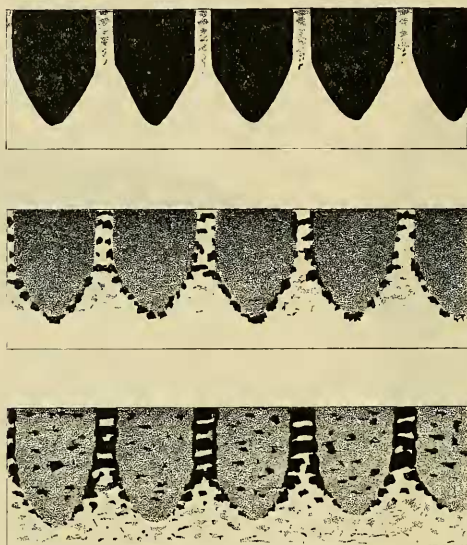
Coloration of young.—Dark brown or black cross-bars, each occupying 4 or 5 transverse series of scales on the upper part of the body, separated by narrow whitish or pale brown lines, less than a scale in width; these bands taper to a point or are rounded off at the sides, where they stand out boldly on the white colour which extends from the ventrals to the lower rows of scales; head pale brown above, upper lip white, the sutures between the shields dark brown or black; lower surface of head and body white, with or without a more or less regular series of small black spots on each side; lower surface of tail white, with a brown or black zigzag median line corresponding to the junction of the pairs of subcaudals. The dark cross-bars on the body number 36 to 39.

Changes with age.—The brown or black cross-bars of the young become generally lighter with age, turning to olive, greyish olive or brown, retaining the dark colour on their edges, so as often to form a zigzag line along each side, corresponding to the angles of the extremities of the cross-bars, the light triangles between them being often spotted with black; the light lines usually become converted into more or less regular series of black and yellowish spots. Some adult specimens, however, retain much

* In specimens No. 3 (Sierra Leone) and 7 (Cameroon).

the same colour-pattern as the young, except that the light bars become divided and of a pale brown; others again differ in being spotted all over with black, or blackish, with lighter, yellowish, or pinkish spots or variegations. Head as in the young. Lower

Text-fig. 298.

Side view of body of *Grayia smythii*.

Diagrams showing changes in markings with age.

parts white, uniform or more or less spotted or freckled with black, often with a lateral series of round black spots; posterior ventrals and subcaudals often edged with black.

Grows to a length of 1650 millim.; tail 500.

Known from West and Central Africa and Uganda.

List of the specimens in the British Museum.

1. ♂.	V. 154; C. 101.	Labé, French Guinea.	Dr. E. Gendré (P.).
2. ♀.	V. 164; C. ?	"	"
3. ♂.	V. 148; C. 97.	Sierra Leone.	Sir A. Kennedy (P.).
4. Yg.	V. 158; C. 93.	Agberi, S. Nigeria.	Dr. W. J. Ansorge (C.).
5. Hgr.	V. 162; C. ?	W. Province, S. Nigeria.	A. E. Kitson, Esq. (P.).
6. ♂.	V. 154; C. 99.	Oil River, Cameroon.	Sir H. H. Johnston (P.).
7. ♀.	V. 161; C. 89.	"	"
8. ♀.	V. 161; C. ?	Cameroon, opposite Fernando Po.	Mrs. Burton (P.).
9. Yg.	V. 150; C. ?	Mouth of the Loango.	Mr. Duggan (C.).

10. Hgr. ♀.	V. 147; C. 93.	Boma, Congo.	Dr. Leach (P.). (Type of <i>C. smythii</i> and of <i>G. silurophaga</i> .)
11. Yg.	V. 160; C. 94.	Zambi, Lower Congo.	Capt. Lepez (C.).
12. ♀.	V. 163; C. 94.	Leopoldville, Congo.	Dr. J. L. Todd (P.).
13. ♀.	V. 159; C. 96.	Monsembe, Upper Congo.	Rev. J. H. Weeks (P.).
14. ♂.	V. 147; C. 98.	District of Victoria Falls.	M. J. Capart (P.).
15. Yg.	V. 155; C. 95.	" "	" "
16. Yg.	V. 152; C. 91.	" "	" "
17. ♀.	V. 161; C. 94.	Entebbe, Uganda.	Sir H. H. Johnston (P.).
18. ♀.	V. 168; C. ?	" "	Mr. E. Degen (C.).
19. Head & tail.		Uganda.	Dr. Scott Elliot (P.).
20. Hgr.	V. 151; C. 97.	— ?	} (Types of <i>G. silurophaga</i> .)
21. Hgr.	V. 149; C. 101.	— ?	

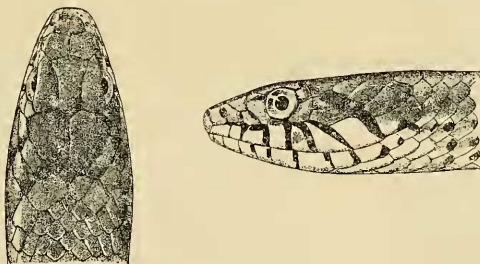
GRAYIA THOLLONI.

Grayia tholloni Mocquard, Bull. Soc. Philom. (8) ix. 1897, p. 11; Bouleng. Ann. Mus. Congo, Zool. ii. 1901, p. 17; Werner, Rep. Wellcome Res. Labor. iii. 1908, p. 170.

Grayia fasciata Bouleng. t. c. p. 9, pl. iii. fig. 3.

Eye rather large, as long as its distance from the nostril, longer than its distance from the oral border. 27 to 30 maxillary teeth on each side. Rostral once and a half to once and two thirds as broad as deep, just visible from above; nasal divided*; internasals as long as broad or a little longer, shorter than the

Text-fig. 299.

Head of *Grayia tholloni*.

præfrontals; frontal once and three fourths to twice as long as broad, longer than its distance from the end of the snout, as long as the parietals; loreal once and one third to once and a half as long as deep; one præ- and two postoculars; temporals 2 + 3 †, lower anterior not longer than its distance from the loreal; eight upper labials, fourth or fourth and fifth ‡ entering the eye;

* Resting on the first labial only in the two type specimens, a character to which Mocquard attaches undue importance; the divided nasal rests on 2 labials in 3 out of the 4 specimens examined by me.

† Exceptionally $\frac{1}{1+2}$ according to Mocquard.

‡ 4th and 5th entering the eye on the left side in a specimen from Barboi, on both sides in one from Entebbe.

four to six lower labials in contact with the anterior chin-shields, which are as long as or a little shorter than the posterior. Scales in 15 rows on the body, in 4 rows on the greater part of the tail. Ventrals 130-143*; anal divided; subcaudals 100-128.

Young blackish above, with narrow white bars which are very distinct on the anterior half of the body and generally disappear further back; upper lip and lower parts white, the labial shields with black bars on the sutures, the ventral shields with a small black spot on the outer end. Only three of the light bars, bordered by black spots, are seen in the half-grown, and they may vanish completely in the adult, which is olive, with small black spots on the sides, and light outer edges to the scales; the black bars on the upper labials are very pronounced, and that between the last two extends upwards on the temporals.

The two type specimens are described as from the French Congo. A young specimen, type of *G. fasciata*, is from the south-west of Lake Tanganyika. The three following specimens are preserved in the British Museum. The largest measures 1200 millim.; tail 490:

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|------------|-----------------|------------------------------|--|
| 1. Hgr. ♂. | V. 135; C. ? | Entebbe, Uganda. | Sir H. H. Johnston (P.). |
| 2. ♀. | V. 143; C. 111. | Polkom, Baro R.,
(Sobat). | Mr. P. C. Zaphiro (C.); W. N.
MacMillan, Esq. (P.). |
| 3. ♂. | V. 134; C. ? | Barboi, White Nile. | Dr. Wenyon (C.); Dr. F.
Werner (P.). |

* 170, given by Werner, is probably a lapsus or misprint.